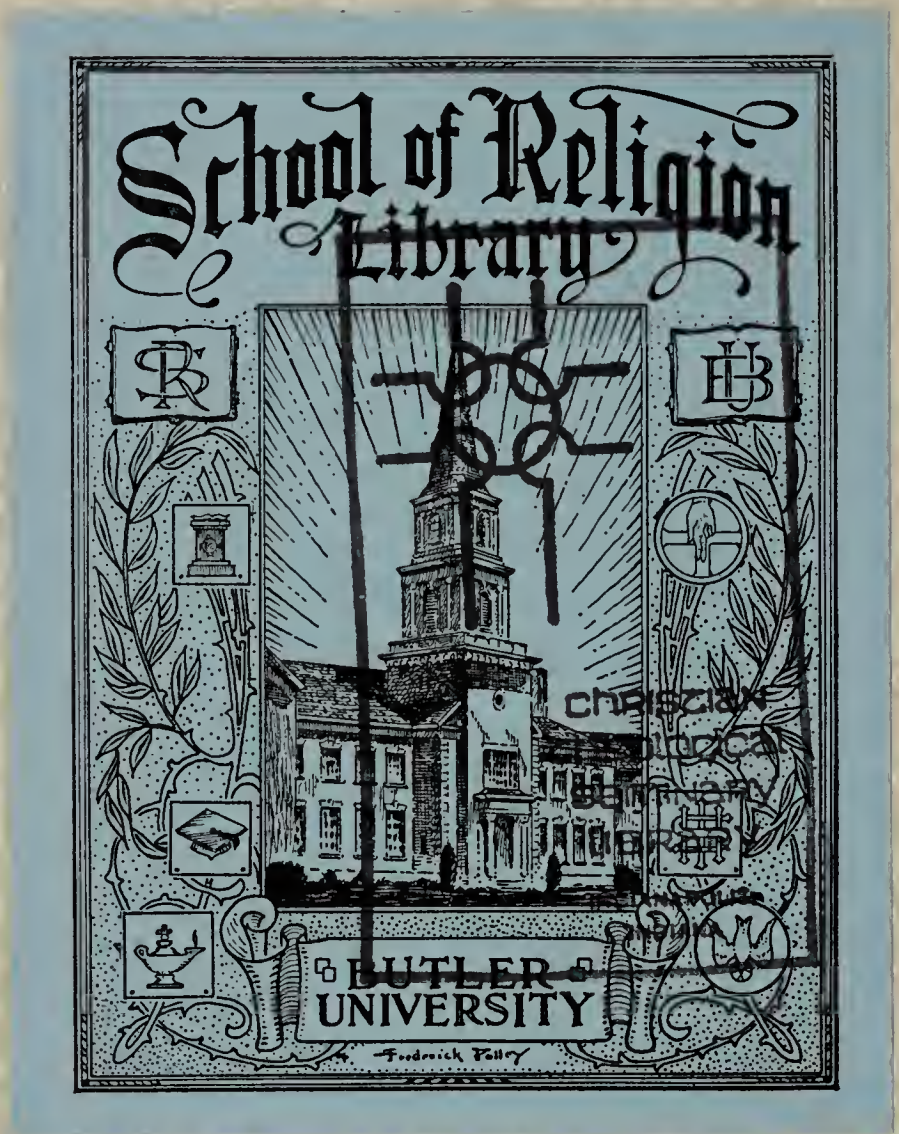
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Science and Christianity

BY

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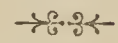
Publishers' Preface.



The Executive of the Student Christian Movement recently appointed a sub-committee to help them in meeting the needs of students who are perplexed on matters concerning the Christian faith. On the advice of the sub-committee it has been decided to issue a series of pamphlets, of which this book is one.

The Student Movement does not make itself responsible for the views set forth in these pamphlets, but offers them as a contribution from different minds and from different points of view towards helping students in their thinking on the whole subject of Christian truth.

Science and Christianity.

William James has written :—

"Humbug is Humbug even though it bear the scientific name, and the total expression of human experience as I view it objectively invincibly urges me beyond the narrow scientific bounds." *

and—

"We and God have business with each other; and in opening ourselves to His influence our deepest destiny is fulfilled. The universe, at those parts of it which our personal being contributes, takes a turn genuinely for the worse or for the better in proportion as each one of us fulfils or evades God's demands . . . God is real since he produces real effects." †

These two quotations from the concluding chapter of the *Varieties of Religious Experience,*

* *Varieties of Religious Experience,* p. 519.

† *Loc. cit.* p. 516.

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sum up the whole matter concerning Science and Religion. My object is to try to trace some of the details of the actions and reactions of these two, and to find a harmony between them where some have found only antagonism and incompatibility.

What I have to say represents a personal view—very little of it in any sense original—gathered from many sources that I cannot identify. But at any rate I have tried to state honestly what appeals to me and what seems to fit in without contradiction to a view of things in general. I am quite ready to admit that this view is largely coloured by the scientific atmosphere. This atmosphere, I also admit, is in some ways narrowing—an effect, however, which is produced by any specialist study. In any case, even if a view be tinged by the habits of mind resulting from specialist study, yet it is *a* view and may contribute to the general store of truth. And nowadays the scientific temper has so filtered into everyday life that it is a thing that has to be reckoned with even by the layman in scientific matters. I shall try first of all to trace some of the influences Science

has had in the past on Religion and then to see how the scientific attitude has changed in the last half-century, and finally to examine the influence of the scientific atmosphere and temper of mind on the religious and Christian notions of our own day.

The real struggle between Christianity and Science had its decisive battle over the Copernican system of astronomy. The Roman Catholic Church held that the earth was the centre of the universe. Galileo in publicly advocating the theory of Copernicus came into conflict with the Church. He was beaten outwardly and forced to retract. Till then the world had been willing to accept the statements of the official voice of the Church as the last words in Science as in all departments of human knowledge. But never again could there be unquestioning acquiescence in statements of fact made by the Church which were inside the province of Natural Science. In the last century the problem came up again. It was brought into prominence by the results of Geology and the Theory of Evolution. The same argument was used. Science was in conflict with Religion—

"the phenomena investigated were directly dependent on the Divine will, and the attempt to investigate them was not only futile but blasphemous." To many it seemed that if the conclusions of Science were true then the very foundations of Religion were undermined. There are many to-day who have the same feeling. But amongst those who count in religious thought the conclusions of Science are accepted unreservedly —or there exists a willingness to accept these conclusions provided the evidence for them is sufficient. Further, the method of the "reconcilers," as Huxley called them, is dropped, and one outcome of the controversies is that we now regard the Bible as a book which does not profess to give us a scientific account of natural phenomena. This result does not trouble anyone when the astronomy of the Bible is in question. Everyone accepts the broad outlines of modern astronomy. Perhaps it is that the astronomy of Genesis and the few references in other parts of the Bible are so obscure that no one finds difficulty in rejecting the ideas implied. It is clear that such references as are to be found imply something like the old

Egyptian system based on a flat earth. A central sun and the earth as a planet are not to be found there. The Ptolemaic system, also, is not to be found there, and it is curious that the Church should have made so much of this system.

In our time the question has to some extent come up again in the problem of the origin of Life. We have had presented to us quite recently by Professor Schäfer, in his Presidential Address to the British Association, the mechanistic* theory of the universe. In this address, Professor Schäfer guarded himself to some extent by definitely excluding the soul from the scope of his remarks. His position *is*, however, the frankly materialistic one of Haeckel—that the whole of life is deducible from certain initial circumstances and material properties. The interesting thing

* Perhaps I should say a word to explain the term "mechanistic," and to point out the difference between mechanistic and materialistic. A mechanistic explanation is one on mechanical principles without the implication of a special philosophy implied by materialism. We explain the wind and weather on mechanistic principles, but this does not assume that matter and energy are the only knowable realities as materialism does.

about this outburst of mechanism is that it is not an attack on religious ideas and expressions, but on a movement amongst the biologists. It is the old orthodox biology defending itself against the new ideas of vitalism, entelechy, neo-vitalism, biotic energy introduced on purely biological grounds without any reference to religion.*

It is long since in England a scientific man of the first rank has advanced so dogmatic a statement of the materialistic point of view. Haeckel, of course, in Germany, has consistently maintained it as a complete philosophy. But as a system of

* The argument of the mechanists is to show that life processes are accounted for by physical laws. This argument is based on certain observed similarities between physical phenomena involving surface tension and osmosis especially and certain vital phenomena such as cell division and the formation of pseudopodia. In other words, the mechanist's position is founded on certain more or less close resemblances between physical and life processes. But there has never been shown anything except similarity. Some of the most important results for the theory are based on a misunderstanding of the very physical processes that are used to explain the vital phenomena. It is impossible to discuss this question here, but the fact is that certain biologists are given to very loose thinking on physical questions, and the words "surface tension" and "osmotic pressure" have come to be very like that "blessed word Mesopotamia."

philosophy its refutation is so complete that no one of weight upholds it. Professor James Ward dismisses materialism in his book, *The Realm of Ends*, thus :—

"Materialistic monism, which we may disregard as obsolete—and neutral or agnostic monism, which we may fairly treat as an inept and ineffectual attempt to get round the deadlock of dualism."*

Dr. Case says† :—

"These materialistic tendencies emanate from scientific writers who rightly try to rise from science to metaphysics, but, as Bacon says, build a universal philosophy on a few experiments. This tendency especially prevails in Biology—which is so far off the general principles of Natural Philosophy that its votaries are often ignorant of the real nature of body as matter and force. On the other hand, scientific men such as Herschel, Maxwell, and Stokes, who approach Nature from

* *Loc cit.*, p. 13. As examples of these monisms we may take the materialism of Haeckel and that of Herbert Spencer.

† *Encyclopædia Britannica*, article on "Metaphysics."

mathematics and mechanics, and therefore from the universal laws of motion, have the opposite tendencies—because they perceive that Nature is not its own explanation. Why do bodies exist—in so harmonious an order—Natural Science has no answer—Natural Theology has an answer. This prevailing order of Nature is the deepest proof of God."

There has been a great change in the views of scientific men during the last half-century. The old claims of natural science are largely given up. Clifford wrote, forty years ago* :—

"The gulf between these two"—the group of mechanical sciences and the group of biological sciences—"has in these last days been firmly bridged over. Such facts as that discovered by Harvey that the movement of the blood was a mere question of Hydrodynamics, and was to be explained upon the same principles as the motion of water in pipes—facts like these have been piled up, one upon another, and have gradually led to the conclusion that the science of organic bodies

* *Lectures and Essays* (Eversley Edition), ii. pp. 5, 6.

is only a complication of the science of inorganic bodies."

And Huxley* :—

"I ask you, what is the difference between the conception of life as the product of a certain disposition of material molecules, and the old notion of an Archaeus governing and directing blind matter within each living body, except this—that here, as elsewhere, matter and law have devoured spirit and spontaneity? And as surely as every future grows out of past and present, so will the physiology of the future gradually extend the realm of matter and law until it is coextensive with knowledge, with feeling, and with action."

Nowadays this certainty and dogmatism are obsolete. Professor Haldane,† President of the Physiology Section at the British Association Meeting in 1908, devoted his address to the Section on the relation of Physiology to Physics and Chemistry. He says :—

"If in some ways the advance of Physiology

* *Methods and Results* (Eversley Edition), p. 159.

† British Association Reports, 1908.

seems to have taken us nearer to a physico-chemical explanation of life, in other ways it seems to have taken us further away. On the one hand we have an accumulating knowledge as to the physical and chemical sources and the ultimate destiny of the material and energy passing through the body; on the other hand an equally rapidly accumulating knowledge of an apparently teleological ordering of this material and energy; and for this teleological ordering we are at a loss for physico-chemical explanations. There was a time, about fifty years ago, when the rising generation of physiologists in their enthusiasm for the first kind of knowledge, closed their eyes to the second. That time is past, and we must once more face the old problem of life . . . In Physiology, and Biology generally, we are dealing with phenomena which, so far as our present knowledge goes, not only differ in complexity, but differ in kind from physical and chemical phenomena."

And Professor D'Arcy Thompson,* in his

* British Association Reports, 1911.

address to the Zoological Section of the British Association in 1911, says :—

" Claude Bernard held that mechanical, physical, and chemical force summed up all with which the physiologist has to deal. Verworn defined physiology as ' the chemistry of the Proteids ' ; but of late . . . it is among the physiologists themselves, together with the embryologists that we find the strongest indication of a desire to pass beyond the horizon of Descartes, and to avow that physical and chemical methods fall short of solving the secrets of physiology. . . . On the whole I think it is very manifest that there is abroad on all sides a greater spirit of hesitation and caution than of old, and that the lessons of the philosopher have had their influence on our minds. . . . With all the growth of knowledge . . . it is yet manifest that the biologists of to-day are in no self-satisfied or exultant mood. That which, above all things, we would explain baffles explanation ; and that the living organism is a living organism tends to reassert itself as the biologist's fundamental conception and fact. Nor will even this concept serve us and suffice us when we approach the

problems of consciousness and intelligence and the mystery of the reasoning soul; for these things are not for the biologist at all."

One more quotation from modern biologists, Geddes and J. A. Thomson, in *Evolution*, one of the Home University Library :—

"Despite the fact that as yet no vitalist writer has succeeded in making himself and his nomenclature really intelligible to any other, and that the frequent gibes at vitalistic metaphysics and mysticism remain largely justified, we confess that the modern movement of vitalism has our increasing sympathy. It affects our evolutionism to this extent at least, that we feel compelled to recognise the persistence of some originative impetus within the organism, which expresses itself in variation and mutation, and in all kinds of creative effort and endeavour."*

We have in these three quotations from leaders in biological science a great contrast to Huxley and Clifford. The two most famous exponents of vitalism are Driesch and Bergson, and both of

* *Loc cit.* p. 203.

them found their philosophy on Natural Science. Driesch as an experimental embryologist shows that it is necessary to postulate an immaterial autonomous factor which he calls entelechy. This guides the transformations of energy within the living body. Bergson, more of a philosopher, postulates an elan vital—a vital impulse of some kind: it is difficult to understand exactly what he means by it—but still it is something beyond mechanics which is creative and runs through all organised nature. The entelechy of Driesch is intelligent. Bergson's vital impulse is not so in the ordinary sense. For our purpose the point is that some life principle is required and biology can no longer be regarded as only complicated Physics and Chemistry. In spite of this the mechanistic theory of life is a perfectly legitimate, scientific theory. It is to be accepted or rejected on the ground of sufficiency or insufficiency of evidence. We have seen that at present at any rate the evidence is certainly not sufficient to satisfy the purely scientific man. The tendency is in fact all in the direction of some form of vitalism. But there is no fundamental argument,

religious or philosophical, as there is against materialism, which makes the mechanistic theory untenable. And it is important to realise that even should this theory be established, to regard that as destroying the foundations of Christianity is to repeat the mistake made by the Church with regard to the Copernican Theory.

The harmful effects of such controversies arise from the partial view that each side takes in dispute. I do not think that there is much danger of this happening to-day. But fifty years ago the champions of both sides became controversialists. It seems to me that the chief fault was amongst the orthodox theologians who took part. The most famous instance of the hostility which arose was the celebrated discussion between Huxley and the Bishop of Oxford, Samuel Wilberforce, after the publication of *The Origin of Species*. It was no wonder that Huxley's fighting instincts—never far below the surface—were aroused. It was a battle of Truth, and the attitude of orthodoxy has resulted in untold harm for religion. The destructive criticism of Science was emphasised. The orthodox party would see nothing in Science

but Atheism, and the protagonists of Science saw nothing but blindness and superstition in the official representatives of Religion. For numbers who understood little of either Religion or Science the result was a weakening, if not a complete destruction of religious belief. Materialism as a system of philosophy, which is a very different thing from a materialistic view of some of the phenomena of nature, and practical materialism, which sums up the life of so many people, received a great impetus. The aggressive anti-religious, and those who are ready for any excuse to avoid thinking, eagerly seized on statements of Huxley and Darwin. Science has proved that Religion was dead. An example of this kind of mind is given in William James's *Varieties of Religious Experience*.* He gives it as an example of answers to certain questions circulated by Professor Starbuck. He says :—

"The writer's state of mind may by courtesy be called a religion, for it is his reaction on the whole nature of things ; it is systematic and reflective.

* P. 92.

. . . I think you will recognise in him, coarse meated and incapable of wounded spirit as he is, a sufficiently familiar contemporary type.

Q. What does Religion mean to you ?

A. It means nothing ; and it seems, as far as I can observe, useless to others. I am sixty-seven years of age, and have resided in X. fifty years, and have been in business forty-five ; consequently I have some little experience of life and men, and some women too, and I find that the most religious and pious people are, as a rule, those most lacking in uprightness and morality. The men who do not go to church or have any religious convictions are the best. Praying, singing of hymns, and sermonising are pernicious—they teach us to rely on some supernatural power when we ought to rely on ourselves. I *tee*totally disbelieve in God. The God-Idea was begotten in ignorance, fear, and a general lack of any knowledge of Nature. If I were to die now, being in a healthy condition for my age, both mentally and physically, I would just as lief, yes, rather, die with a hearty enjoyment of music, sport, or any other rational pastime. As a timepiece stops, we die—there being no immortality in either case.

Q. Have you had an experience which appeared providential ?

A. None whatever. There is no agency of the superintending kind. A little judicious observation as well as a knowledge of scientific law will convince anyone of this fact.

And part of the answer to :—

Q. What things work most strongly on your emotions ?

A. I greatly enjoy Nature, especially fine weather. . . . I never go to church, but attend lectures when they are good ones. All of my thoughts and cogitations have been of a healthy and cheerful kind, for instead of doubts and fears I see things as they are, for I endeavour to adjust myself to my environment.

Q. What is your temperament ?

A. Nervous, active, wide-awake, mentally and physically. Sorry that Nature compels us to sleep at all.

William James says :—

" If we are in search of a broken and contrite heart, clearly we need not look to this brother. His contentment with the finite incases him like

a lobster shell and shields him from all morbid repining at his distance from the Infinite. We have in him an excellent example of the optimism which may be encouraged by popular science."

We can recognise in this a philosophy whose best known exponent in England is H. G. Wells. *First and Last Things* expresses, perhaps, not quite so crudely but essentially the same "reaction on the whole nature of things." But there is no real basis for this kind of attitude in the ideas of leaders in Science. Darwin and Huxley, who have been most quoted in this connection, were very careful to guard their statements and expressly to deny materialism as a system of philosophy. Huxley says * :—

"But the man of science who, forgetting the limits of philosophical enquiry, slides from these formulæ and symbols into what is commonly understood by materialism, seems to me to place himself on a level with the mathematician who should mistake the x's and y's with which he works his problems, for real entities—and with

* *Methods and Results*, p. 165.

this further disadvantage, as compared with the mathematician, that the blunders of the latter are of no practical consequence, while the errors of systematic materialism may paralyse the energies and destroy the beauty of a life."

Darwin,* after the publication of *The Origin of Species*, wrote to Dr. Asa Gray the following—

"With respect to the theological view of the question. This is always painful to me. I am bewildered. I had no intention to write atheistically. But I own I cannot see as plainly as others do, and as I should wish to do, evidence of design and beneficence on all sides of us. There seems to me too much misery in the world. . . . On the other hand, I cannot anyhow be contented to view this wonderful universe, and especially the nature of man, and to conclude that everything is the result of brute force. I am inclined to look at everything as resulting from *designed* laws, with the details, whether good or bad, left to the working out of what we may call chance. Not that this notion *at all* satisfies me. I feel most

* *Life and Letters of Charles Darwin.* F. Darwin: ii. p. 311.

deeply that the whole subject is too profound for the human intellect. . . . Let each man hope and believe what he can. Certainly I agree with you that my views are not at all necessarily atheistical."

Clifford,* who is often regarded as one of the most uncompromising representatives of the materialists, could write :—

"But there are forms of religious emotion which do not undermine the conscience. Far be it from me to undervalue the help and strength which many of the bravest of our brethren have drawn from the thought of an unseen helper of men. He who, wearied or stricken in the fight with the powers of darkness, asks himself in a solitary place, 'Is it all for nothing? Shall we indeed be overthrown?' he does find something which may justify that thought. In such a moment of utter sincerity, when a man has bared his own soul before the immensities and the eternities, a presence in which his own poor personality is shrivelled into nothing arises within him, and says as plainly as words can say, 'I am with thee, and I am

* *Lectures and Essays*, ii. p. 244.

greater than thou.' No such comradeship with the Great Companion shall have anything but reverence from me who have known the divine gentleness of Denison Maurice, the strong and healthy practical instinct of Charles Kingsley, and who now revere with all my heart the teaching of James Martineau. They seem to me, one and all, to be reaching forward with loving anticipation to a clearer vision that is yet to come."

These three quotations are sufficient to show what little justification there is for William James's materialistic optimist to found his philosophy on the sayings of scientific leaders. He, a man who can never have known affection or bereavement, bases his theory on popular science; and it is often the case that popular science is used as a peg on which to hang practical materialism. We shall not be far wrong, however, if we regard this operation as an excuse—a shallow excuse of the half-educated. For in these days, when life is so full of material facilities for enjoyment, there are many who find the simple way of not thinking seriously about anything easy to follow. And popular science does give some

sanction to this kind of materialist. In Carlyle's words * :—

"It is an unbelieving people which has suppositions, hypotheses, and froth systems; . . . and for belief this mainly—that Pleasure is Pleasant."

We have seen how the situation has changed; how the claims of natural science have become less dogmatic and more modest. At the same time, Christianity has been freed from a good many beliefs as to the course of the material history of the universe. I think that most people will agree that this is for religion all a gain. The main effect has been to cause a great deal more of attention to be paid to the really central and fundamental features of Christianity. This greater attention to the essential—and to finding out what the essential is—has been brought about by the co-operation of many factors. The general revival of learning in the nineteenth century, of which the advance in Natural Science was only a part, has acted as a solvent of the older traditional views of Christianity. Historical Criticism and the spread of

* *French Revolution.* Bk. II. Ch. 3.

philosophical ideas have had an enormous influence, and the result of all these has been to focus Christian thought on the Personality of Jesus Christ. As D. S. Cairns says in *Christianity in the Modern World* * :—

"The historic Personality of Jesus has risen upon the consciousness of the Church with the force almost of a new revelation. It is literally true that this century is face to face with that great figure as no century has been since the first."

At this point it is impossible to avoid altogether the question of miracle. This question has been the subject of much controversy and misunderstanding. There was bound to be conflict over miracles, but I think it is becoming clear that the issue has not the importance that has been attributed to it.†

* P. 14.

† The older Christian Apologetic regarded miracles as one of the main evidences of the truth of Christian doctrine. Paley, in his *Evidences of Christianity*, devotes himself to establishing the truth of the Christian miracles and to discrediting others. An instance of the failure to recognise the change of view brought about by modern science and historical criticism is that of the University of Cambridge which even now requires the study of Paley's *Evidences*

We must always remember that the traditional forms in which Christianity became expressed were developed at times when very little was thought of Uniformity in Nature. Supernatural agencies were at work in everything. It was inevitable that the expression of views with regard to the doings of such a transcendent Person as that of Jesus should be in statements not in accordance with the ideas of modern times—times when one of the firmest beliefs as to events in the material universe is that they are all examples of Law and Order. Nowadays the mode of defence adopted by Paley and other apologists has been completely given up. Whether miracles are *à priori* conceivable or not, they are of no use for convincing anyone not otherwise persuaded of the truth of Christianity. As Canon Rashdall says * :—

"Even if we treat the Gospel miracles as real

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of most of its students. There can hardly be conceived a better method of bringing popular discredit to Christianity. The only book bearing on religion that most students of that University read is one whose whole method is given up by all serious theologians, and whose arguments can be seen to be fallacious by anyone at all acquainted with modern movements.

* *Philosophy and Religion*, p. 160.

exceptions to law, the difficulty of proving them in the face of modern critical enquiry is so great that the evidence will hardly come home to anyone not previously convinced on purely spiritual grounds, of the exceptional character of our Lord's personality and mission." . . . "When we have become Christians on other grounds, the acts of healing may still retain a certain value as illustrating the character of the Master, and the Resurrection vision as proclaiming the truth of Immortality in a way which will come home to minds not easily accessible to abstract argument."

Science has no right to say miracles have not occurred. On any theistic hypothesis they might occur, and it is in each case a question whether the evidence for that case is sufficiently convincing. For some the evidence is convincing, others may take the opposite view. The important thing is to realise that the truth of Christianity—the recognition of Jesus Christ as our Lord and Saviour—is not bound up with a belief in the miracles recorded of Him. To quote Canon Rashdall again * :—

* *Loc. cit.*

"All that I have said"—concerning the Christian Revelation—"is quite consistent with the unqualified acceptance or with the unqualified rejection of miracles."

The mind trained in natural science will find great difficulty in accepting the evidence for the suspension of a law of nature. There is an enormous amount of experience of the regularity of these laws, and there is widespread belief in events which contradict these laws, but which, in cases that can be tested, turn out to be always cases of exaggerated attention to certain features or of mistaken observation. These facts make it almost impossible for a mind trained in natural science to be convinced by the evidence for any definite suspension of a law of nature. There are, of course, many events which may have been regarded as miraculous, but further knowledge may show them to have been misunderstood. A great many miracles of healing may come under this head. If we exclude this kind of explanation it seems to me futile to explain as has often been attempted by Christian apologists. Such an explanation, for example, as that of the Star in the East by the

conjunction of three large planets does not help in the least. If the explanation be true, the point of the story is gone. The wise men made a mistake and would never have been led to Bethlehem by such a star. Explanation of this kind is of the same nature as the reconciliation of Genesis with Geology. The weakness of such treatment is that if the miracle is explained it is explained away, and we might just as well have been without the story. In any case, even if we believe in miracles unquestioningly, they are not the ground-work of our faith. Some words of Clifford are specially applicable here, though he gave them a wider application. He wrote of the frightful loss and disappointment that may ensue for a child who may grow up and be convinced that a doctrine he has been brought up to regard as true is founded on insufficient evidence.

"It is not merely that you have brought him up as a prince to find himself a pauper. He may have allowed this doctrine to get inextricably intertwined with his feelings of right and wrong. Then the overthrow of one will, at

least for a time, endanger the other. You leave him the sad task of gathering together the wrecks of a life broken by disappointment and wondering whether honour itself is left to him among them. Leave him free of this doctrine, and his conscience will rest upon its true base safe against all storms; for it is built upon a rock."

If we could keep clear in our own minds, and in what we say, the distinction between two kinds of belief we should avoid a great deal of controversy and save a good deal of revolt from Christianity. For we all have two kinds of belief. There are many things we believe as they fit in with our general scheme of things, but which we cannot support by evidence which forces conviction; and there are other things which we can state to be true because we have been able to test the evidence for, or have had personal experience of, them. However strongly I think a thing to be true for which I have not evidence that forces conviction, it may be false; if I insist on this as part of my system, another who has reason to disbelieve this will have a poor opinion of my honesty or my

intelligence. The true parts of my system will be rejected with the false. A simple illustration is found in Macaulay's story of the missionary to Madagascar who, as part of his message, taught that as woman was made from the rib of man, men ever since had one rib less than women When the king ordered ribs to be counted, the missionary's influence was gone. It may be said that this principle will carry us so far that there will be little left. But the result must be faced. If we are to do anything for Christianity what we have to say must be our own—it must be what we have ourselves experienced. Even if we are left only with the fact that contact of some kind with the Personality of Jesus has made us better men and women as the one thing we really know, that is a great deal. That must be the foundation, if our Christianity is more than an acquiescence in a developed traditional system. And on that foundation we can build. If the thing is real to us there is not much doubt that we shall believe much more though, perhaps, not in so fundamental a sense.

Science and Christianity.

So far the influence of Science that we have considered is negative. It remains to be seen if there is any positive contribution that Science can make to Christianity and what the influence of the scientific temper of mind is on Christianity. First of all we must get a clearer notion of the aims and limitations of Science. Science does not pretend to give ultimate explanations. It is only a very superficial acquaintance with any branch of Science that leads to a sense that there is any complete explanation of any part of Nature. With every step that Science takes new regions open up, and the less complete the knowledge already attained seems. A very little thought about the fundamental assumptions of natural science shows what a leap over initial insoluble difficulties has to be made for any progress to be possible. I can refer only very briefly to two of these as examples. First and foremost the assumption of the Uniformity of Nature. This can never be proved. It is assumed as the ground of every scientific induction, and clearly it cannot be known as the result of such induction. Then there are the difficulties involved in the very notion of

measurement. It is easiest to see the real nature of these difficulties in the case of time. There is no method by which we can compare one interval of time with another. There is no means of doing anything with time intervals analogous to comparing two lengths by laying them alongside each other. We simply have to assume that some arbitrary method of comparison is valid. The justification for this is that we arrive at a consistent system and are able to a certain extent to prophesy events. But we must recognise that the validity of our results is not an absolute one. Science, in fact, seeks to answer certain kinds of questions, but her answers are in no sense complete. The universe for Science is of set purpose objectified—regarded as object, and is at once not the whole universe. There is much reality in the beauty of a rose, but Botany has nothing to do with this. The rose is more than the physicist, chemist, and botanist can make of it—all truth is not to be arrived at by scientific paths. Wordsworth's knowledge of Nature is as truly knowledge as that of the biologist—more truly, as he takes account of subject as well as

object. Here I may quote Professor Ward again in *The Realm of Ends** :—

"The universe as a whole is only partly accessible to us at the best: but we make up for this defect to some extent by viewing it from different standpoints. It is, therefore, important first of all, if we can, to ascertain which of these is the most fundamental and to orientate the rest to this. One characteristic belongs to them all—that duality of subject and object that enters into all experience. But the subject's attitude towards the object is twofold: it is both cognitive and conative, or, as we often say, both theoretical and practical. Though these subjective attitudes are not strictly separable, yet the practical terminates in the theoretical so soon and so far as what we immediately want is *only* to know. And so it comes about that, ignoring the subject and its practical relations, forgetting even what knowledge implies (as we forget the eye when intent only on what we see) we are led to conceive the universe as in itself *only* objective. From this stand-

* P. 430.

point we call it Nature, and we ask simply what is it : the one problem here is to find a precise and comprehensive description, and the result is what Newton called Natural Philosophy."

The question is then : Can Science with its aims and limitations make any positive contribution to Religion ? In one way I think it can, with the aid of a little philosophy. Science has brought into clearness the view we have of the Order of Nature. This, which is at once the fundamental assumption and the aim of Science, means a great deal for Religion. For that which is external to the self is seen to be rational—intelligible—and this rationality is not imposed by our consciousness—it is here inherent in Nature. Nature is not a chaos, but does correspond with our intelligence For some minds this amounts to a proof that Nature is the manifestation of an intelligent being. We can at any rate recognise that there is in Nature an element that is identical with what goes to make up part of our own personality. As I have already quoted : " This prevailing order of Nature is the deepest proof of God." If we cannot be entirely satisfied with this as a proof, it is at least an

argument of great weight. In any case there is no inconsistency between the Order of Nature and the idea of a Personal God. This, it seems to me, is the one direct contribution Science can make to Religion. It is a contribution of great value and becomes more and more impressive as knowledge of Nature becomes deeper. In the nature of the case natural science can do no more. For she has definitely limited herself to the phenomenal and shut herself off from the consideration of any reality behind the phenomena.

We come now to the last part of our survey, the influence of the scientific temper of mind. At first sight there is no doubt that the scientific mood is different from, and even antagonistic to, the religious mood. But I think the antithesis is really only on the surface and will disappear when the two things are examined more carefully. We must bear in mind the self-imposed limitations that natural science sets up, and remember that the province of natural science does not include the whole of man's nature. For a great many people Religion means on its practical side a belief that a beneficent providence will interfere with

the ordinary course of events of Nature in answer to prayer. This aspect of the religious mood is certainly antagonistic to the scientific mood. The scientific man is living constantly with things that verify the great generalisations of Science, he is continually seeing the constant order of Nature. Scepticism of reported facts that are contrary to this order in Nature as he knows it becomes a part of his mental attitude, and things which many people can believe without hesitation the scientist will reject even when reported by people whose good faith is beyond question. After even a little experience of work in a physical laboratory it is much easier to conclude that there are errors of observation than that the laws of Nature have ceased to be true. But it is not only the evidence of others that the scientific man distrusts. The evidence of his own senses he doubts, and it is only after much repetition and experiment that he will be convinced of the reality of an observation. But in spite of all this, the scientific man is on the look out for new phenomena; he is, if he has the proper spirit, ready to accept the new thing however contrary it may be to his preconceived

notions. His mind is open—often enough it has not been, but hardly ever in the case of the great men. This attitude of mind—preparedness for new discovery—the realisation of the possibility of any well-established theory being found wanting —the readiness to listen open-eared to the voice of Nature and to catch what he can of her message —this, it seems to me, is not far from the truly religious spirit. This spirit is always found in the great men of Science.

And Science has nothing to say in criticism of prayer that is communion. This is an experience which we can verify ourselves. We know directly that the influence of person on person, and the effect of prayer we can each of us verify in our own lives. It is a shallow pyschology that tries to reduce such action to auto-suggestion. It is as futile as to explain in the same way the conversion of St. Paul or St. Francis of Assisi. But this is a different thing from the belief that God will interfere with the regular operations of cause and effect. I cannot convince myself that God will answer prayers, for example, for fine weather or rain by sending these. My whole experience

leads me to conclude that such things do not occur. I have, of course, no right to say they cannot occur, but it seems to me that they do not—that God does not act in that way. But that He can act on my mind and conscience I am sure of. And that I can come into relation with Him is a fact that natural science cannot say anything about. The validity of such knowledge is, I agree, for myself alone, but it is knowledge that anyone can test in the only convincing way by personal experience.

We have seen that Science takes account of object only. But this is by no means what the scientific investigator does. If it were so, there would be little progress in Science. The characteristic of the successful scientist is a continual interest and delight in the things he deals with. There are scientific people who are dry—as there are in other subjects. These, perhaps, are the true scientists, but the great men, the men who make their study live, have a never-failing joy and pleasure in the things themselves and in their wider relations. This is all hopelessly unscientific. In spite of that, it is what gives real value to

Science. This attitude of mind, the satisfaction derived from getting deeper into things—the desire for some part of the truth—the attempt to get into a more intimate relation to the universe—these are the things that have real value. And this is a mental attitude not alien to the aim of Religion—to get into personal relation with God.

Closely allied to the characteristic of which we have been speaking is the spirit of wonder. Wonder, Plato said, is the mother of Philosophy; and Coleridge:—

"All knowledge begins and ends with wonder; but the first wonder is the child of ignorance; the second wonder is the parent of knowledge."

This spirit is again not scientific, but the scientific man has it in a higher degree as his knowledge is more profound. For some the scientific explanation of a phenomenon takes away all its sublimity. The rainbow ceases to be a sign from God and becomes a simple example of the laws of optics. But this is not the case in general. With the great men it is not so. The sublimity of Nature is more real the more a man knows of its processes, and

for the wonder of ignorance there is substituted the wonder of knowledge. And not only this, but in spite of the realisation that comes with knowledge that after all what is known is a very little, there is also the realisation of the power and dignity of the human mind which has been able to wrest such knowledge as we have from Nature. Kant compared the awfulness of the spectacle of the starlit sky to that of the moral sense. The modern astronomer feels the same awe even though he has been able to weigh the stars and find of what they are constructed. He also feels what a wonderful thing it is that the human mind has been able to penetrate so far into such mysteries. Is not this the same spirit as that of the Psalmist ? —

"When I consider Thy heavens the work of Thy fingers, the moon and the stars which Thou hast ordained—what is man that Thou art mindful of him ? and the son of man that Thou visitest him ? Thou makest him to have dominion over the works of Thy hands. Thou hast put all things under his feet."

Another indirect effect that scientific activity has had on the form of religious ideas arises from the emphasis that is laid on first-hand knowledge. We have already seen something of this in thinking about miracles. It is an effect on method, but it is one which has had far-reaching results. It has produced the school of theology in Germany founded by Ritschl. This school has influenced theological ideas everywhere to a great extent. The fundamental principle of these theologians is that Christianity is to be based on the personal appeal of Christ to the moral and religious nature of mankind. That is to say, they have rejected as authoritative for Christianity anything that does not admit of individual verification. This is the true scientific attitude. Science admits no authority as absolute. It is true that the scientist believes many things on the authority of others—but only provisionally—only when the thing believed is of such a nature that the evidence might be obtained if the truth of the matter be called in question. For example, everyone who has studied physical astronomy believes on spectro-

scopic evidence that iron exists in the sun. Very few people, comparatively, have for themselves verified this result, but the methods of verification are well known, they could be put in operation any day by anyone with the necessary apparatus, and there is no reasonable doubt that had the conclusion been wrong the flaws in the evidence would have been pointed out long before this. When a reputable scientific man makes an observation a result may be believed on his authority, but only when it is a result capable of verification. And this is the *only* kind of authority that Science recognises. It is not, therefore, an authority such as has often—in the history of Christianity and of other religions—been claimed for a church or an ecclesiastical order. And it is getting more and more widely recognised that the claim for such an absolute authority has no validity. Let me again quote Canon Rashdall * : he is talking of the body of religious truth that may be handed

* *Philosophy and Religion*, p. 157. In this section—and in that dealing with miracles—I owe a great deal to Canon Rashdall, more than I can identify, so I take this opportunity of acknowledging my indebtedness in ideas and in phraseology to his *Philosophy and Religion*.

down by tradition in an organised society. He says :—

"We recognised the supreme importance to the moral and religious life of such historical revelations, on one condition—that the claim of any historical Religion to the allegiance of its followers must be held to rest, in the last resort, upon the appeal which it makes to their Reason and Conscience."

And again :—

"We refuse in the last resort, to recognise any revelation as true except on the ground that its truth can be independently verified."

These are courageous words ; yet they represent simply the scientific attitude, and this refusal to accept as true everything that cannot be verified is what we must come to if we wish to preserve our intellectual honesty and to press home to others what Christianity means for us. For there is no doubt to the non-Christian there is a great deal in the ordinary presentation of Christianity which is unreal, a great deal that is meaningless, and a great deal that, though the Christian may

believe it in an indefinite sense, is not an essential part of his belief, and that conveys no clear idea to his own or to other minds. And I am convinced that if our own Religion is to make any appeals to others—and if we have caught the Spirit of Christ in any measure, we must feel the supreme importance of this—that what we have to say about it must come straight from our own experience, and we must get rid of all unreality so that what we speak of must be our own first-hand ideas on the subject. Again, some of us will perhaps be left with a small message, but it is better to have the smallest message that really means something to us than an elaborate metaphysical theory that we do not understand. It seems to me that this principle ought to run all through, not only preaching and teaching of any kind, but also our worship and religious observance generally. It is fatally easy in intellectual matters to get into slipshod methods, looseness of thought and reasoning; and it is easier and more disastrous in religious matters. It is a terrible thing but it is true, that it is easier to be dishonest in religious observance than in any other part of our

lives. The outsider sees that we are dishonest and will have nothing to do with any of our churches. By all means let us have a developed system, but let us realise that a great deal of it is not essential. Let us realise that our philosophies are intellectual superstructures. They may differ, but our foundations are the same. They are not in metaphysical statements about Jesus Christ, but are in a personal relation to Him and in an endeavour to enter into His mind. They lie in a personal knowledge of God which is in a very real sense through Jesus Christ.

The ethics of belief are the same for Science and Religion. The difference is in the relative importance of the beliefs for life. It does not matter much whether one believes that there is iron in the sun or not. There is no reason why a man who has never heard of the Conservation of Energy may not be a good member of society. But religious beliefs affect all sides of life and have an enormous effect on conduct.

There is one more aspect of the subject that I can only mention very briefly. I have tried to show some of the effects that Science has had on

Religion and to bring out some of the tendencies towards Religion which may be found in the spirit of scientific activity. Apart from all this we can have a scientific study of the phenomena of Religion. In its wider scope such a science would take in all religions, but for our purposes we must in the main limit ourselves to the phenomena of Christianity. This would still include comparative religion, but we can have a narrower branch of the study still and limit the scope again to phenomena of Christian experience. In this way we have a branch of psychology. This subject has been treated by William James in the *Varieties of Religious Experience.* This is a great book on the scientific study of the phenomena of Christianity. The main impression obtained from reading it is of the reality of the ordinary facts of Christian experience—conversion, mystic communion, and of their practical fruits for life. These facts are undoubted and the only scientific attitude towards them is that of investigation and testing the hypotheses advanced to explain them. William James shows convincingly that these things can only be dealt with by spiritual

judgments—the way they appeal directly to our reason—and by value judgments—the way they seem to meet our moral needs. The attempted explanation of them on physiological grounds is futile. He says of Saint Theresa :—

"Saint Theresa might have had the nervous system of the placidest cow, and it would not now save her theology if the trial of the theology should show it to be contemptible. And conversely, if her theology can stand these tests, it will make no difference how hysterical or nervously off her balance Saint Theresa may have been."

William James attempts to show that the pragmatic test of truth is the only one to be applied to the phenomena investigated. The way in which a belief works out in life is the final test. The value of a belief can be determined to some extent by a scientific study of religious experience. The criticism of the belief itself belongs to philosophy.

Mystic states and spiritual experiences generally can have authority only for the people themselves

who undergo them—there is no valid reason for others than the partakers of such experiences to accept the revelations that come through them. But the fact of their existence breaks down the authority of the rationalistic consciousness which bases itself on understanding and sense alone. But though the person outside such experience may take up an agnostic position, it is only an agnostic position for himself. He may say "I don't know," but has no right to say "You can't know." One has no right to criticise unless one can understand the evidence.

We have finished our survey. We come back to what we started from: "The total expression of human experience invincibly urges me beyond the narrow scientific bounds." "We and God have business with each other." It is for us to find out what the business is. Most of us will agree that any knowledge we may have of what that business is has come to us through Jesus Christ. Perhaps not directly, but if we honestly trace it to its source we find it is from Him. We most of us probably owe at any rate the beginning of our Christian experience to some we have known

who in their lives and characters have shown something of the Spirit of Christ. Let me conclude with a quotation from Dr. T. R. Glover's *Conflict of Religions in the Early Roman Empire.** Here a part of our business with God seems clear :—

"What was written in the Gospels of the life and death of Jesus, might by now be ancient history, if the Gospels had told the whole story. But they did not tell the whole story; and they neither were, nor are, the source of the Christian movement, great as their influence is and has been. The Jesus who has impressed Himself upon mankind is not a character, however strong and beautiful, that is to be read about in a book. Before the Gospels were written, men spoke of the Spirit of Jesus as an active force among them. We may criticise their phrase and pyschology as we like, but they were speaking of something they knew, something they had seen and felt, and it is that something which changed the course of history. Jesus lives for us in the pages of the Gospels, but we are not His followers on that account, nor were the

* P. 139.

Christians of the first century. They, like ourselves, followed Him under the irresistible attraction of His character repeating itself in the lives of men and women whom they knew. The Son of God, they said, revealed Himself in men, and it was true. Of His immediate followers we know almost nothing, but it was they who passed Him on to the next generation, consciously in their preaching, which was not always very good; and unconsciously in their lives, which He had transformed. . . . If we are to give a true account of such men as Alexander and Cæsar, we consider them in the light of the centuries through which their ideas lived and worked. In the same way, the life, the mind, and the personality of Jesus will not be understood till we have realised by some intimate experience something of the worth and beauty of the countless souls that in every country have found and still find in Him the Alpha and Omega of their being. For the Gospels are not four but 'ten thousand times ten thousand and thousands of thousands,' and the last word of every one of them is, 'Lo, I am with you alway, even unto the end of the world.'"

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